

WHAT IS CLAIMED IS:

1. A method of detecting a post-translational modification of a predetermined protein expressed by a cell, comprising the step of: specifically detecting an O-sulfonation of a serine or threonine residue of the protein.

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2. The method of claim 1, wherein the detected O-sulfonation is detected under a first physiological condition, and is compared with a control O-sulfonation detected under a second physiological condition.

10 3. A method of modifying a predetermined protein expressed by a cell, comprising the step of introducing a predetermined change in O-sulfonation at a serine or threonine residue of the protein.

15 4. The method of claim 3, wherein the introducing step comprises introducing or increasing O-sulfonation at the serine or threonine of the protein.

5. The method of claim 3, wherein the introducing step comprises eliminating or reducing O-sulfonation at the serine or threonine of the protein.

20 6. The method of claim 3, wherein the introducing step comprises eliminating or reducing O-sulfonation at the serine or threonine of the protein using a serine/threonine sulfotransferase inhibitor selected from the group consisting of a carbohydrate sulfotransferase inhibitor, a purine sulfotransferase inhibitor, and a bisubstrate sulfotransferase inhibitor, [LIST].

25 7. The method of claim 3, wherein the introducing step comprises derivatizing or substituting O-sulfonation at the serine or threonine of the protein.

8. The method of claim 3, further comprising the step of detecting a resultant change in O-sulfonation.

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9. The method of claim 3, further comprising the step of detecting a resultant change in O-sulfonation by specifically detecting a physiological change predetermined to be correlated

with the change in O-sulfonation.

10. An isolated antibody which specifically binds an O-sulfonated protein expressed by a cell, wherein the specific binding is dependent on the presence of an O-sulfonated serine or
5 threonine residue in the protein.